

Notes on *Anomalohalacarus anomalus* (TROUESSART, 1894)
(Acari: Halacaridae)—A Controversy on Its Taxonomy

Hiroshi ABÉ¹⁾

安倍 弘¹⁾: ウシオダニの1種 *Anomalohalacarus anomalus*
(TROUESSART, 1894) の分類について

Abstract Some halacarid specimens from the North Sea and the NEWELL's collection, usually known under the name *Anomalohalacarus anomalus* (TROUESSART, 1894), are re-examined. The material from the North Sea is identified as *A. anomalus*, and some taxonomic characters of *A. anomalus* are emended based on this material. NEWELL's specimens should be referred to *A. tenellus* BARTSCH, 1979 and *A. tenuis* BARTSCH, 1979, on the basis of the leg and palpal chaetotaxies.

One of the arenicolous halacarids, *Anomalohalacarus anomalus* was originally described as *Halacarus anomalus* by TROUESSART (1894) on specimens collected from the English Channel. Thereafter, NEWELL recorded this species from the North Atlantic coast of the United States (NEWELL, 1947), and established the genus *Anomalohalacarus* NEWELL for *Halacarus anomalus* TROUESSART, 1894 without examining TROUESSART's type material (NEWELL, 1949).

The original description of *Anomalohalacarus anomalus* by TROUESSART (1894) is somewhat insufficient and makes no reference to some critical taxonomic characters. Furthermore, a detailed re-examination of the TROUESSART's type material can not be made because of their deteriorated condition.

These circumstances have resulted in a confusion in the identity of *Anomalohalacarus anomalus*. Since the establishment of the genus *Anomalohalacarus* by NEWELL (1949), several researchers have expressed doubt as to whether *A. anomalus* sensu NEWELL is the same species as TROUESSART's (cf. VIETS, 1952; MONNIOT, 1967; BARTSCH, 1975).

Recently the present author had an opportunity to re-examine two kinds of materials passing under the name of *Anomalohalacarus anomalus*. One of them

1) Department of Systematic Zoology, Graduate School of Environmental Science, Hokkaido University, Sapporo, 060 Japan

Present address: Department of Marine Sciences & Technology, School of Engineering, Hokkaido Tokai University, Sapporo, 005 Japan

北海道大学 大学院環境科学研究科

現在: 北海道東海大学 工学部海洋開発工学科

Accepted December 7, 1992

is from the North Sea, and the other is from the NEWELL's collection. To prevent further taxonomic confusion about *A. anomalus*, the author aims to check up some doubtful previous descriptions of *A. anomalus* and to clarify what *A. anomalus* sensu NEWELL really is by making re-examination of specimens from these two localities.

Abbreviations: PD, posterodorsal plate; AE, anterior epimeral plate(s); PE, posterior epimeral plate(s); P-1 to P-4, first to fourth segment of palp.

Genus *Anomalohalacarus* NEWELL

Anomalohalacarus NEWELL, 1949, p. 21; BARTSCH, 1981, p. 67; BARTSCH, 1983, p. 186; GREEN & MACQUITTY, 1987, p. 58.

Type species: *Halacarus anomalus* TROUESSART, 1894.

Diagnosis. Body slender, fusiform. Plates greatly reduced. Ocular plates and corneae absent. PD and AE usually divided into two platelets. AE each with three setae, PE each with four setae. Genital plate divided in female, and undivided in male. Gnathosoma long. Palp four-segmented; P-1 without setae; P-2 with one or two setae; P-3 with one spiniform seta; P-4 with three basal setae. Legs slender; Leg I longer than the others. Tarsus I with pronounced fossary lamellae.

Ecological notes. Typically interstitial in habitat. Only one nymphal instar (protonymph) has been known.

Anomalohalacarus anomalus (TROUESSART)

(Fig. 1)

Halacarus anomalus TROUESSART, 1894, p. 156, pl. 7 (fig. 2, 2a-2d); ANDRÉ, 1946, p. 62, figs. 31-32; MONNIOT, 1967, p. 89, fig. 1.

Halacarus anomalus sensu MONNIOT: MORSELLI, 1969, p. 293 (table).

Anomalohalacarus [sic] *anomalus* sensu MONNIOT: BARTSCH, 1975, p. 660 (table 1).

Anomalohalacarus anomalus sensu MONNIOT: BARTSCH, 1976, p. 37 (table 2); MORSELLI & MARI, 1978, p. 77 (table 1).

Anomalohalacarus anomalus: GREEN & MACQUITTY, 1987, p. 60, fig. 20.

Specimens examined. One female & 1 male, 25 m depth, Skagerrak, off Sweden, North Sea, 19-VII-1982, C. POIZAT leg. [Private collection (No. F160 & F338) of I. BARTSCH, Biologische Anstalt Helgoland, Notkestrasse 31, D-2000 Hamburg 52, Germany].

Diagnostic characters are shown in Table 1.

Remarks. Specimens taken from the English Channel and at Roscoff [adjacent to the type locality of *A. anomalus* (TROUESSART, 1894)], the North Sea, and the Baltic, were identified by MONNIOT (1967) as *Halacarus anomalus*, based on a precise comparison between his material and the original description by TROUESSART. *Halacarus anomalus* redescribed by MONNIOT (1967) seems to be reliable.

As the result of an examination of the present specimens, these from the North Sea are identified as *Anomalohalacarus anomalus* (TROUESSART, 1894). These specimens well accord with the description by MONNIOT (1967) except

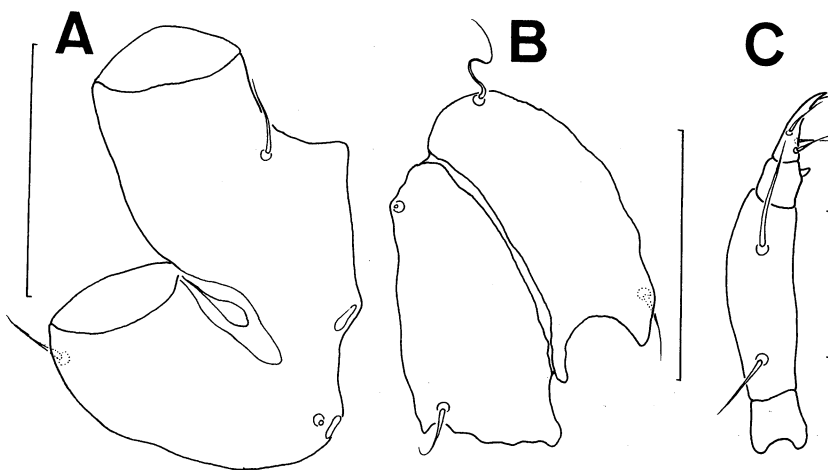


Fig. 1. *Anomalohalacarus anomalus* (TROUESSART): A, AE (right); B, PE (left); C, Palp (left). Scale bars=50 μ m.

for the following points (corresponding condition in the description by MONNIOT in parentheses): 1) AE with three setae (two setae); 2) PE with four setae (three setae); and 3) dorsoproximal seta on P-2 is shorter than P-2 length (longer than P-2 length) [cf. Fig. 1, Table 1].

The discrepancies in the number of the epimeral setae on AE and PE between the present study and the MONNIOT's description could be resulted from his oversight of a seta in each case (lateral setae of coxae II and those of coxae III). Referring to the length of the dorsoproximal seta on P-2, the disagreement may reflect merely individual variation.

The present study makes it clear that *Anomalohalacarus anomalus* (TROUESSART) is easily discernible from its congeners by the unique leg chaetotaxy as follows: 1) two filiform ventral setae in middle of the segment of tarsus I; 2) four setae (2 filiform, 1 spiniform, 1 bipectinate) in middle of the segment of tibia I; and 3) four dorsal setae (3 filiform, 1 bacilliform) on tarsi III and IV each [cf. Table 1].

It is clear that "*Halacarus anomalus*" by NEWELL (1947) should not be confused with *Anomalohalacarus anomalus* (TROUESSART, 1894). The number of setae on P-2 and the leg chaetotaxy described by NEWELL are completely different from those in *A. anomalus*.

When considered the leg chaetotaxy, "*Halacarus anomalus*" reported from the Tyrrhenian Sea by MORSELLI (1969) and that from the Indian coast by RAO (1970) are not *Anomalohalacarus anomalus* (TROUESSART) but belonging to other distinct species. Under existing circumstances, unfortunately, specific names of specimens from these two localities do not become clear.

At the present time, a worldwide distribution of *A. anomalus* should be restricted within the coasts of the north western Europe. Records from the North America, the Mediterranean, and the Indian Ocean are invalid.

***Anomalohalacarus tenellus* BARTSCH**

Anomalohalacarus tenellus BARTSCH, 1979, p. 31, figs. 55–65.

Halacarus anomalus [in part, nec TROUESSART]: NEWELL, 1947, p. 97, figs. 130–142.

Halacarus anomalus sensu NEWELL: MONNIOT, 1967, p. 93; MORSELLI, 1969, p. 293 (table).

Anomalohalacarus [sic] *anomalus* sensu NEWELL: BARTSCH, 1975, p. 660 (table 1).

Specimens examined. Five females (idiosoma length: 240–292 μm , gnathosoma length: 68–84 μm) labeled as “*Anomalohalacarus anomalus*,” Morris Cove, Connecticut, U.S.A., 11–VI–1943, I. M. NEWELL leg. [National Museum of Natural History, Acari Collection, Systematic Entomology Laboratory, BARK–W, USDA, Beltsville, MD 20705, U.S.A.]. One female & 1 male [paratype], Pettaquamscutt, Rhode Island, U.S.A., 12–V–1978, I. BARTSCH leg.; 3 females & 1 male, Block Island, Rhode Island, U.S.A., 8–V–1978, I. BARTSCH leg. [Private collection (No. U70 & U26) of I. BARTSCH].

Diagnostic characters are shown in Table 1. *A. tenellus* was originally described from the coast of Rhode Island, U.S.A.

***Anomalohalacarus tenuis* BARTSCH**

Anomalohalacarus tenuis BARTSCH, 1979, p. 34, figs. 66–73.

Anomalohalacarus anomalus [in part, nec TROUESSART]: NEWELL, 1947, p. 97, figs. 130–142.

Halacarus anomalus sensu NEWELL: MONNIOT, 1967, p. 93; MORSELLI, 1969, p. 293 (table).

Anomalohalacarus [sic] *anomalus* sensu NEWELL: BARTSCH, 1975, p. 660 (table 1).

Specimens examined. Two females (idiosoma length: 312–316 μm , gnathosoma length: 128–132 μm) labeled as “*Anomalohalacarus anomalus*,” New Haven, Connecticut, U.S.A., 1944, I. M. NEWELL leg. [National Museum of Natural History, Acari Collection]. One female, Block Island, Rhode Island, U.S.A., 8–V–1978, I. BARTSCH leg.; 2 females, Jamestown, Rhode Island, U.S.A., 16–V–1978, I. BARTSCH leg. [Private collection (No. U26 & U94) of I. BARTSCH].

Diagnostic characters are shown in Table 1. *A. tenuis* was originally described from the coast of Rhode Island, U.S.A.

Remarks on “*Anomalohalacarus anomalus*” in NEWELL’s collection

The re-examination of NEWELL’s specimens indicates some unsuitableness of his description (NEWELL, 1947) as follows [NEWELL’s description in parentheses]: 1) P–2 with one seta proximally (P–2 without setae); and 2) PE with 4 setae (3 setae).

Considering aforementioned emendable points, description and illustrations of *Halacarus anomalus* sensu NEWELL (1947) well agree with those of *Anomalohalacarus tenellus* and *A. tenuis*.

When NEWELL (1949) originally established the genus *Anomalohalacarus* for *Halacarus anomalus* TROUESSART, 1894, he described the generic diagnosis based not on TROUESSART’s type material but on specimens identified as *H.*

Table 1. Comparison of diagnostic characters of *Anomalohalacarus anomalus* (TROUSSERT), *A. tenellus* BARTSCH and *A. tenuis* BARTSCH.

Characters/Species	<i>A. anomalus</i>	<i>A. tenellus</i>	<i>A. tenuis</i>
PD	divided	divided	divided
AE	divided	divided	divided
Striation of membranous cuticle	conspicuous	modest	modest
Number of perigenital setae in male	24 ¹⁾ , ca. 26 ²⁾ , 33 ³⁾	85-94	94-99
Number of setae on each AE	3	3	3
each PE	4	4	4
P-2	2	1 (proximal)	1 (proximal)
Number of ventral setae in middle of segment of tarsus I	2 (filiform)	1 (spiniform)	1 (spiniform)
Number of ventral setae on tarsus II	1	1	1
Number of dorsal setae on tarsus III	4 (1 bacilliform, 3 filiform)	3 (filiform)	3 (filiform)
on tarsus IV	4 (1 bacilliform, 3 filiform)	3 (filiform)	3 (filiform)
Number of setae in middle of segment of tibia I	4 (2 filiform, 1 spiniform, 1 bipectinate)	2 (1 filiform, 1 spiniform)	3 (2 filiform, 1 spiniform)
Number of bipectinate setae on telofemur	0-1-0-1	0-0-0-1	0-0-0-1
on genu	2-2-1-1	0-0-1-1	0-0-1-1
on tibia	1-2-2-2	0-1-2-2	0-1-2-2

1) MONNIOT (1967)

2) Present study

3) Examination of TROUSSERT's type material by BARTSCH (1975)

anomalus (specimens in NEWELL's collection). Therefore, in reality, the generic diagnosis of *Anomalohalacarus* described by NEWELL (1949) is based on *A. tenellus* and *tenuis*.

Some of the previously reported diagnosis of the genus *Anomalohalacarus* (cf. BARTSCH, 1981, 1983; GREEN & MACQUITY, 1987) are considered to be still useful.

Acknowledgments

I wish to thank Dr. I. BARTSCH of Biologische Anstalt Helgoland for giving me a chance to examine *Anomalohalacarus anomalus* from the North Sea, and *A. tenellus* and *A. tenuis* in her private collection. I am also grateful to Dr. R. L. SMILEY of USDA for supplying "*A. anomalus*" from NEWELL's collection and correcting my English expression.

摘 要

ウシオダニの1種 *Anomalohalacarus anomalus* (TROUESSART, 1894) は、原記載が不十分なことと模式標本の再検討が困難なことから、分類学上の混乱を招いている。そこで、従来 *A. anomalus* に同定されてきた北海産の標本と NEWELL の所蔵標本の再検討を行った。その結果、北海産の標本は *A. anomalus* であることが確認され、この標本に基づいて本種の判別形質の補足、修正を行った。一方、NEWELL (1947, 1949) が *Anomalohalacarus* 属の模式種として記載した標本は、脚や触肢の毛式から、*A. anomalus* ではなく、*A. tenellus* BARTSCH, 1979 と *A. tenuis* BARTSCH, 1979 の2種が混在していることが判明した。

References

- ANDRÉ, M., 1946. Halacariens marins. *Faune Fr.*, **46**: 1-152.
- BARTSCH, I., 1975. Beitrag zur Halacariden-Fauna (Halacaridae, Acari) der Bretagneküste. Beschreibung von fünf Arten aus dem Sandlückensystem. *Acarologia*, **17**: 652-667.
- 1976. Ergänzungen zur Halacariden-Fauna (Halacaridae, Acari) im Becken von Archcon. *Vie Milieu*, sér. A, **26**(1): 31-46.
- 1979. Halacaridae (Acari) von der Atlantikküste Nordamerikas, Beschreibung der Arten. *Mikrofauna Meeresboden*, **79**: 1-62.
- 1981. Die Gattungen *Anomalohalacarus* und *Halacaroides* (Halacaridae, Acari), geographische Verbreitung, Bestimmungstabelle und Beschreibung dreier neuer Arten. *Zool. Beitr.*, **27**: 67-84.
- 1983. Vorschlag zur Neugliederung des Systems der Halacaridae (Acari). *Zool. Jb. Syst.*, **110**: 179-200.
- GREEN, J., & M. MACQUITTY, 1987. Halacarid mites. *Synopses Br. Fauna* (N.S.), **36**: 1-178.
- MONNIOT, F., 1967. Deux halacariens endopsammiques: *Halacarus anomalus* TROUESSART et *Halacarus marcandrei* n. sp. *Cah. Biol. mar.*, **8**: 89-98.
- MORSELLI, I., 1969. Ricerche sugli Alacaridi della coste Livornesi. I. Studio preliminare di alcune specie raccolte su fondi sabbiosi. *Atti Soc. Nat. Mat.*, **100**: 280-298.
- & M. MARI, 1978. Alacaridi di acque lagunari e costiere della Toscana meridionale. *Atti Soc. Tosc. Sci. Nat. Mem.*, ser. B, **85**: 63-91.
- NEWELL, I. M., 1947. A systematic and ecological study of Halacaridae of eastern North America. *Bull. Bingham oceanogr. Coll.*, **10**(3): 1-232.
- 1949. New genera and species of Halacaridae (Acari). *Am. Mus. Novit.*, (1411): 1-22.

- RAO, G. C., 1970. On some interstitial fauna in the marine sands of Indian coast. *Curr. Sci.*, **39**: 504-507.
- TROUOSSART, E. L., 1894. Note sur les Acariens marins (Halacaridae) récoltés par M. Henri GADEAU DE KERVILLE sur le littoral du département de la Manche (Juillet-Aout 1893). *Bull. Soc. Amis nat. Rouen*, **9**: 139-175.
- VIETS, K., 1952. Diskussion einiger Halacariden-Genera (Acari). *Veröff. Mus. Bremen*, Reihe A, **2**: 91-104.